

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 April 2005 (21.04.2005)

PCT

(10) International Publication Number
WO 2005/035841 A2

(51) International Patent Classification⁷: **D01F**

(21) International Application Number:
PCT/US2004/033602

(22) International Filing Date: 12 October 2004 (12.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/510,707 10 October 2003 (10.10.2003) US

(71) Applicant (for all designated States except US): **BOARD OF REGENTS, THE UNIVERSITY OF TEXAS SYSTEM** [US/US]; 201 West 7th Street, Austin, TX 78701 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MALDONADO,**

Stephen [US/US]; 3517 North Hills Drive #C204, Austin, TX 78731 (US). **STEVENSON, Keith, J.** [US/US]; 1505 Madison Avenue, Austin, TX 78757 (US).

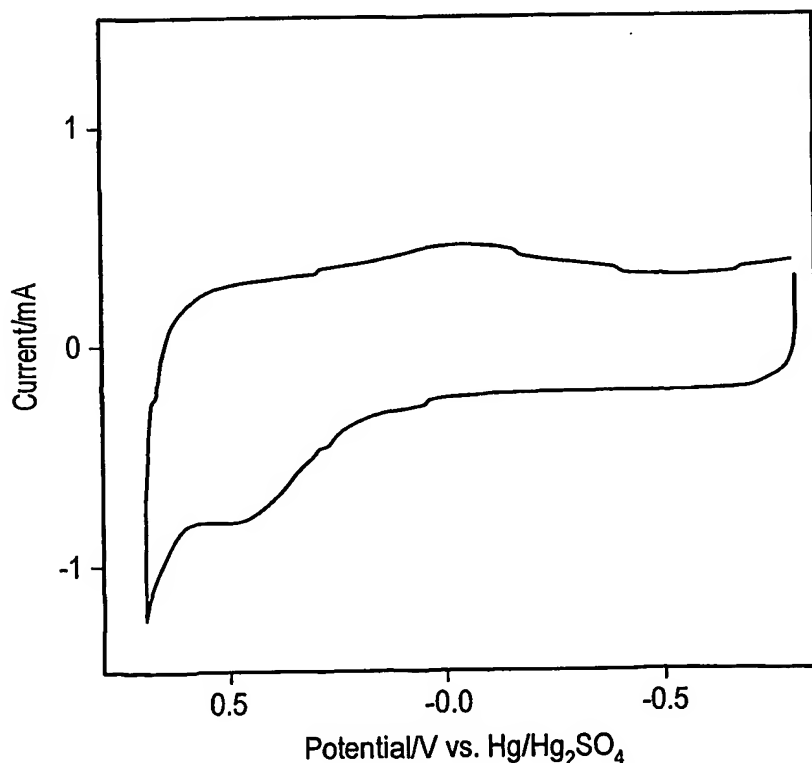
(74) Agent: **MEYERTONS, Eric, B;** MEYERTONS, HOOD, KIVLIN, KOWERT & GOETZEL, P.C., P.O. Box 398, Austin, TX 78767-0398 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: **CARBON NANOSTRUCTURE-BASED ELECTROCATALYTIC ELECTRODES**



(57) Abstract: Carbon nanostructure (e.g., CNF) electrodes disclosed herein may be conveniently prepared on conductive substrates by pyrolysis of an organometallic nanostructure precursor in a reducing atmosphere. Such electrodes may possess suitable properties for preparation of electrocatalytic electrodes and electrochemical sensors. High surface area nitrogen doped CNFs prepared according to certain embodiments are conductive and may exhibit high stability and improved catalytic activity for O₂ reduction in aqueous solutions.



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.